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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/597,949   | 11/06/2006  | Masato Mori          | P30449              | 8311             |
| 52123 7590 11/21/2008<br>GREENBLUM & BERNSTEIN, P.L.C.<br>1950 ROLAND CLARKE PLACE<br>RESTON, VA 20191 |             |                      |                     |                  |
| EXAMINER<br>PATEL, DEVANG R  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1793   |             |                      |                     |                  |
| NOTIFICATION DATE  |             | DELIVERY MODE        |                     |                  |
| 11/21/2008   |             | ELECTRONIC           |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

Application No.

10/597,949

Applicant(s)

MORI ET AL.

Examiner

DEVANG PATEL

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 15-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date 11/14/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The form and legal phraseology (i.e. "comprising" in this case) often used in patent claims should be avoided. It is suggested to use "method composed of".

### ***Drawings***

3. Figures 9-11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Zhou et al. (US 5985043).

- a. **Regarding claim 1**, Zhou et al. ("Zhou") discloses an electronic component mounting method in which joints between a circuit substrate 100 and electronic component 130 [figs. 1-3] are reinforced using a resin 120/320 (adhesive composition includes resin - abstract), the method comprising:
- i. supplying an unhardened reinforcing resin 120/320 on the circuit substrate 100;
  - ii. supplying a solder paste [col. 10, lines 41-46] on bond areas (110/210) of the circuit substrate on which electrodes (140/240) of the electronic components are to be bonded;
  - iii. placing the electronic components on the circuit substrate [figs 1-5]; and
  - iv. heating (i.e. reflow) and cooling the substrate [col. 11, lines 55-67] with reinforcing resin, the solder paste, and the electronic components carried thereon.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. **Claims 2-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al. (US 5985043) as applied to claim 1 above, and in view of Nakamura et al. (US 6365499).

b. **As to claim 2**, the claim is substantially similar to claim 1 except the supplied resin is in sheet-form resin. Rejection of claim 1 is incorporated herein for repeated limitations. Zhou discloses the steps being performed in order, but it is unclear whether resin 120 [fig. 1] is in sheet-form. However, such is well-known in the art as shown by Nakamura et al. ("**Nakamura**"). Similar to layer 120

of Zhou, Nakamura discloses supplying a sheet-form resin 43 on the circuit substrate 40 [fig. 5B]. The claim would have been obvious because supplying a sheet-form resin is an equivalent structure known in the art and one of ordinary skill would have found it obvious to substitute resin layer of Zhou by sheet-form resin of Nakamura.

c. **As to claim 3**, Nakamura discloses the sheet-form resin including equally spaced apertures 44 [fig. 5c].

d. **As to claims 4-5**, Nakamura discloses the sheet-form resin including recesses/holes (44) [fig. 5c] at positions that match the electrode bond areas (42) on the circuit substrate (40).

9. **Claims 6-14** are rejected under 35 U.S.C. 103(a) as being obvious over Zhou et al. (US 5985043) with supporting evidence of Hayama et al. (US 6051448).

e. **As to claim 6**, Zhou's step of supplying adhesive composition with the solder paste on the substrate is analogous to printing the solder paste on bonds areas of the substrate. **Hayama et al.** (drawn to method of manufacturing an electronic component) discloses printing patterns of paste on a substrate in forming conventional components [col. 1, lines 20-25]. The printing step would have been obvious to one of ordinary skill in the art at the time of the invention because printing a solder paste on the lands of substrate is a known technique of supplying paste. Zhou discloses that the adhesive composition (includes paste and resin) may also include viscosity modifiers for adjusting the viscosity (i.e. fluidity) [col. 3, lines 62-64]. Zhou further states that in order for the adhesive

composition to achieve the largest spreading and wetting by the solder, it should maintain low viscosity up to the melting temperature of the solder. If the composition becomes too thick before the solder has melted, it will impede the flow of the solder melt and reduce the degree of soldering [col. 9, lines 4-10]. One skilled in the art reading Zhou would understand and appreciate the idea of controlling viscosity (i.e. fluidity) of the adhesive paste composition to obtain good wettability and strong solder joints. In view of that, it would have been obvious to a person of ordinary skill in the art at the time of the invention to restrict the fluidity of the solder paste so that the paste retains its shape in order to provide an increased degree of soldering [col. 9, lines 4-10]. Zhou discloses the steps of placing the component, soldering and hardening the resin in order.

- f. **As to claim 7**, Zhou discloses controlling the fluidity as explained in claim 6 above and shows deformation of the paste when the components are mounted [figs. 2, 4-5].
- g. **As to claim 8**, the solder paste is inherently dried during the reflow step of Zhou and accordingly, it is reasonable to expect that the solvent or the like would evaporate.
- h. **As to claim 9**, Zhou discloses the solder paste covering a specified area of the substrate [figs. 4-5] is dried.
- i. **As to claim 10**, Zhou discloses drying by a heater (reflow furnace).
- j. **As to claim 11**, Zhou discloses the reinforcing resin being applied on a specified area.

- k. **As to claim 12-13**, Zhou discloses the resin composition having a flux effect [col. 11, line 50] and an effect of bonding [col. 11, line 66].
- l. **As to claim 14**, Zhou discloses that the mounted electronic components are retained by deformation of the solder paste that deforms by a mounting load and by adhesive power of the reinforcing resin [figs. 2, 4-5].

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 11/14/06 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Conclusion***

#### **Claims 1-14 are rejected.**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Noro et al. (US 6916538), Wang (US 6773958), Crane et al. (US 6667194), Gonzalez et al. (US 2003/0080437).

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./

Examiner, Art Unit 1793

/Kiley Stoner/

Primary Examiner, Art Unit 1793